

Application No. 10/700,136
Response to Office Action

Customer No. 01933

Listing of Claims:

1. (Currently Amended) A semiconductor device comprising:
a semiconductor substrate having a plurality of connecting
pads on one surface;

an insulating film which is formed on of a single layer and
5 covers said one surface of the semiconductor substrate, and
having which includes: (i) a plurality of holes extending through
the insulating film, each of the holes corresponding to one of
the connecting pads, ~~an upper surface, and a recess having~~
and (ii) at least one recess extending partially through the
10 insulating film such that a bottom surface of the recess
is depressed from the with respect to an upper surface of the
insulating film in a direction of thickness of the insulating
film; and

interconnections at least one interconnection formed on one
15 of the upper surface of the insulating film or on and the bottom
surface of ~~the~~ a corresponding said at least one recess, and each
said at least one interconnection being connected to a
corresponding one of the connecting pads through a corresponding
one of the holes in the insulating film.

2. (Currently Amended) A device according to claim 1,
wherein ~~each of the interconnections~~ each said interconnection is

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formed on the bottom surface of the corresponding recess in the insulating film.

3. (Currently Amended) A device according to claim 1, wherein each of the ~~recesses~~ said recess in the insulating film has a pair of side surfaces, and ~~spaces are defined~~ a space is provided between each said at least one interconnection and the side surfaces of the at least one recess.

4. (Currently Amended) A device according to claim 1, wherein the ~~interconnections have~~ the at least one interconnection comprises a connecting pad ~~portions~~ portion, and which

5 wherein the semiconductor device further comprises:

a bump ~~electrodes~~ electrode formed on the connecting pad ~~portions~~ portion, and

10 an encapsulating film formed ~~between~~ around the bump ~~electrodes~~ electrode and on the insulating film ~~including~~ and the interconnections.

5. (Withdrawn - Currently Amended) A device according to claim 4, further comprising an upper insulating film formed between the insulating film and the encapsulating film, and said

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upper insulating film having ~~holes~~ a hole formed in ~~portions~~ a portion corresponding to the ~~each said bump electrodes~~ electrode.

6. (Withdrawn - Currently Amended) A device according to claim 5, wherein the insulating film and upper insulating film are made of materials containing ~~the~~ a same main component.

7. (Withdrawn - Currently Amended) A device according to claim 5, wherein the upper insulating film and ~~the~~ encapsulating film are made of different materials.

8. (Withdrawn - Currently Amended) A device according to claim 4, wherein each of ~~the said bump electrodes~~ electrode protrudes from an upper surface of the encapsulating film.

9. (Withdrawn - Currently Amended) A device according to claim 4, wherein each of ~~the said bump electrodes~~ has electrode comprises a lower bump electrode and an upper bump electrode formed ~~thereon~~ on the lower bump electrode.

10. (Withdrawn - Currently Amended) A device according to claim 9, wherein the lower bump electrode protrudes from ~~the~~ an upper surface of the encapsulating film.

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11. (Withdrawn - Currently Amended) A device according to claim 1, wherein the ~~interconnections have~~ at least one interconnection comprises a connecting pad portions portion formed on the corresponding one of the connecting pads to which
5 the interconnection is connected, and which

wherein the semiconductor device further comprises:

at least one bump electrodes electrode formed on the connecting pad ~~portions~~ portion of the at least one interconnection, and

10 an encapsulating film formed between around the bump electrodes electrode and on the insulating film.

12. (Original) A device according to claim 1, wherein the insulating film is made of an organic resin.

13. (Currently Amended) A device according to claim 1, wherein the recess in the insulating film has a depth which is not less than a thickness of the interconnection.

14. (Original) A device according to claim 1, wherein the insulating film has a thickness of 10 to 30 μm .

15. (Original) A device according to claim 1, wherein the recess has a depth of 5 to 15 μm .

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16. (Currently Amended) A device according to claim 15, wherein a distance between a bottom surface of the insulating film has a thickness of and the bottom surface of the recess is not less than 1 μm ~~from the bottom surface of the recess.~~

17. (Withdrawn - Currently Amended) A device according to claim 1, wherein the ~~interconnections are~~ at least one interconnection is formed on the upper surface of the insulating film.

18. (Withdrawn - Currently Amended) A device according to claim 17, wherein the recess in the insulating film has a width which is substantially the same as ~~intervals~~ an interval between the adjacent interconnections.

19. (Withdrawn - Currently Amended) A device according to claim 17, wherein the ~~interconnections have~~ at least one interconnection comprises a connecting pad portions portion, and which

5 wherein the semiconductor device further comprises:
 at least one bump electrodes electrode formed on the connecting pad ~~portions portion,~~ and

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10 an encapsulating film formed ~~between~~ around the bump
~~electrodes~~ electrode and on the insulating film ~~including~~ and the
interconnections.

20. (Withdrawn - Currently Amended) A device according to
claim 19, ~~which~~ further ~~comprises~~ comprising an upper insulating
film formed between the insulating film and the encapsulating
film, ~~and holes~~ said upper insulating film including a hole
formed in ~~portions~~ a portion corresponding to the each said bump
~~electrodes~~ electrode.

21. (Withdrawn - Currently Amended) A device according to
claim 20, wherein the insulating film and upper insulating film
are made of materials containing ~~the~~ a same main component.

22. (Withdrawn - Currently Amended) A device according to
claim 20, wherein the upper insulating film and the encapsulating
film are made of different materials.

Claims 23-35 (Canceled).

36. (New) A semiconductor device comprising:
a semiconductor substrate having a plurality of connecting
pads on one surface;

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an insulating film which covers said one surface of the
5 semiconductor substrate, and which includes: (i) a plurality of
holes extending through the insulating film, each of the
holes corresponding to one of the connecting pads, and (ii) at
least one recess extending partially through the insulating film
such that a bottom surface of the recess is depressed with
10 respect to an upper surface of the insulating film in a direction
of thickness of the insulating film; and

at least one interconnection formed on one of the upper
surface of the insulating film and the bottom surface of a
corresponding said at least one recess, each said at least one
15 interconnection being connected to a corresponding one of the
connecting pads through a corresponding one of the holes in the
insulating film;

wherein each said recess in the insulating film has a pair
of side surfaces, and a space is provided between each said at
20 least one interconnection and the side surfaces of the at least
one recess.

37. (New) A semiconductor device comprising:

a semiconductor substrate having a plurality of connecting
pads on one surface;

a protective film formed of a single layer, said protective
5 film including: (i) a plurality of holes extending completely

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through the protective film, each of the holes corresponding to one of the connecting pads, and (ii) a plurality of recesses extending partially through the protective film such that the protective film has a plurality of recessed surfaces in the
10 recesses which are lower than an upper surface of the protective film in a thickness direction of the protective film; and

interconnections which are respectively connected to the connecting pads through the holes in the protective film, and which are provided on one of the upper surface and the recessed
15 surfaces of the protective film.